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Report on the Status of the Kashmir Stag: October 1965

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(*With one coloured and four monochrome plates*)

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I. INTRODUCTION

This report deals with the Kashmir Stag, *Cervus elaphus hanglu* Wagner, 1884—known locally in Kashmir as the *hangul* and to some sportsmen as the *barasingha*. Although the *hangul* is a subspecies (of the Red Deer *Cervus elaphus* of Europe), it assumes some significance as being probably the only Asiatic survivor of this genus, since *Cervus elaphus wallichi* (the *shou*) appears to have disappeared from the Eastern

Himalayas, and the present status of the other Asiatic subspecies is unknown and rather doubtful.

It is not possible for me to provide a great amount of useful information on the *hangul*, for my knowledge of it is only based on a few very brief expeditions to its habitat during the past eight years and a perusal of the available literature on the subject. Rather I am attempting in this report to depict some of the background which may be useful to ecologists in the future ; and I am drawing attention to what is *not* known rather than to what *is* known. I also refer to the necessary measures which are not (so far as I am aware) being taken to ensure its survival.

II. General Review and Summary of Report

The *hangul* of Kashmir are definitely declining in numbers, and at the present downward rate are certain to become extinct in the foreseeable future—unless effective steps are taken to preserve them. Considering that their main habitat is not only the main catchment area of the Srinagar water supply but also a most beautiful part of the world, it seems obvious that full protection should immediately be given to both the *hangul* and its habitat by the creation of a sanctuary or national park.

III. Historical

Up till 1947 Kashmir was a princely state, and the *hangul* were regarded as ' royal game ' by the Maharaja. As such they were strictly protected in various game preserves or *rakhs* so that their numbers would be sufficient to provide sport for the Maharaja and his friends.

Although there is a lot of data on where the deer were to be found, on how to stalk them and on the measurements of the animals and their antlers after they had been shot, very little has been recorded of their life history, habits, social behaviour and so on.

And although there were game wardens and staff for the protection of game, nothing is mentioned of the numbers of *hangul* in the old days. No estimates have even been given, but after discussing this subject on many occasions with experienced Kashmiris I am led to believe that there may have been about 3000 to 5000 of them some sixty years ago, and about 1000 to 2000 in the year 1947.

During the troublesome years that followed the constitutional accession of Kashmir to India and the objections of Pakistan to Kashmir being administered by India, their numbers may have become depleted to about 300, but by 1957 they seem to have increased a little, to (say) 400. In 1957-58 a rough estimate was made by the local staff which put their numbers at 550—a figure which I think may have been on the optimistic side.

By the end of 1960 enquiries revealed that they may have fallen to about 250, and some people thought in 1962 that there may be only 175-200 still in existence, although an official ' census ' in that year put the population at 360. In February 1965 the local staff did another ' census ' and gave their numbers as 280, but I always prefer to be more conservative in such matters and think there may be only about 180 left alive today.

Fortunately not much of the habitat of the *hangul* is on or near the cease-fire line between India and Pakistan, and most of the *rakhs* fall in that part of Kashmir administered by India. The real danger, then, to the survival of the *hangul* has been and still is the generally unsettled conditions and not directly the military operations. It appears that absence of real stability in the region has prevented genuine and lasting conservation measures from being instituted. Priority is usually given to the more immediate and pressing day-to-day needs of the people, to the detriment of long-term measures designed to conserve nature and wild life for the ultimate benefit of the country.

IV. Geographical and Ecological

The part of the valley of the Jhelum which constitutes the broad and beautiful Vale of Kashmir is approximately 5000 ft. above sea-level, with the surrounding mountains rising up to 13,000 ft. and more. Numerous tributaries flow into the Jhelum, and it is in some of these smaller and narrower valleys that the deer come down to winter at elevations of about 5500 ft. to 6000 ft.

The climate and vegetation of the valleys could be loosely described as temperate 5000 ft. to 8000 ft., then sub-alpine 8000 ft. to 9000 ft. and then alpine 9000 ft. to 14,000 ft. The summer range of the *hangul* is spread over the mountains as high as 15,000 ft. or 16,000 ft., while in the winter they come down to the valleys as mentioned above. By far the larger number come down to Lower Dachigam (13 miles from Srinagar) and neighbouring *rakhs*. These lower valleys include willow and oak (the latter introduced from Britain) on which the deer browse in the winter, while the upper ranges include blue pine, juniper and birch. A beautiful stream named the Dagwan, stocked with brown trout introduced from Britain about sixty years ago, flows through Lower Dachigam.

In the centre of Lower Dachigam is the former shooting lodge of the Maharaja, called Draphama Rest House, about 16 miles from Srinagar. Three miles further up the valley is Phalipora Rest House. There are several ' fire lines ', relics of old shooting days, which are still cleared every year at the end of March to provide unobstructed views of the deer to staff and visitors.

The only other deer existing in the area besides the *hangul* is the tiny musk deer *Moschus moschiferus* which somehow survives near the snow line in spite of being persecuted for its musk pod. Wild predators on the *hangul* are the leopard *Panthera pardus*, the marten *Martes foina intermedia*, the black bear *Selenarctos thibetanus* and the brown bear *Ursus arctos*.

With regard to predators Ward (1921) records : ' Leopards take many deer, both stags and hinds. Bears are always on the look-out for new-born fawns. The Indian martens when hunting in families will pull down fawns of six or eight months of age ' ; and Stockley (1936) writes : ' Leopards are a terror . . . Kashmiris say that a leopard will spring on a calf and lie on it without killing it, until its bleatings draw the mother near enough for the leopard to seize her, and the calf is also then killed. Two reliable observers have told me of coming on a scene which would bear out this Kashmiri story, and in each case the interruption sent off the leopard and the calf was quite unhurt, although the leopard had been lying on it. '

As for black bears Stockley (1936) has recorded : ' Black bears are destroyers of new-born calves, and will work along a hill-side trying the upward wind for the scent of hind and young '. Col. Harry Nedou has informed me that he has seen a brown bear kill twenty sheep of which it probably took away one to eat, but he does not think that bears kill deer.

But by far the worst predators of the *hangul* are human beings. These vary from V.I.Ps., who somehow obtain a permit from the Prime (now Chief) Minister of Kashmir to shoot a stag (supposed to be a protected species) even inside Dachigam (supposed to be a sanctuary), down to local villagers with their crop-protection guns. And high up in the mountains during summer the professional graziers, shepherds and goatherds (*gujars*, *bakr-wallas*) with their flocks of domestic animals have guns and dogs with which they seem to kill the deer whenever possible.

About these graziers Ward (1925) says : ' The disturbance caused by the goatherds and the shepherds acts in a deleterious way on the best stags, as they keep up high, seldom consorting with the herds.' And Stockley (1936) states : ' They are too much poached by the *gujars* ', and : ' By far the worst enemies of the *barasingh* are the *gujars* and the shepherds . . . . Most damage is done amongst the hinds, and many are shot in summer by the shepherds high above the tree line '. And Col. Harry Nedou has again and again informed me of the havoc wrought by poachers with their crop-protection guns and by the *gujars* and *bakr-wallas* with their guns and dogs.

V. Administrative and Political

The preservation of wild life in Kashmir is the responsibility of the Game Warden, who is (nowadays, at any rate) an officer of the Forest

Department and therefore under the Chief Conservator of Forests. Due, however, to the peculiar status of Lower Dachigam, which possesses (1) a trout hatchery with channels drawn off from the river Dagwan, (2) a certain amount of forest as well as the *hangul*, and (3) a beautiful rest house amid wonderful scenery where the deer come in the winter, the place has successively been under the administration of (1) the Fisheries Department up till 1954, (2) the Forest Department 1954 to 1960, and (3) the Tawaza (or Entertainment) Department 1960 to 1964, and (4) again back to the Forest Department 1964 onwards.

So it is not difficult to understand why there has been some confusion and lack of continuity in the administration of Lower and Upper Dachigam which constitute the main habitat of the *hangul*. Paradoxically enough, the deer probably received the best protection of all while under the Fisheries Department, because the Head of that Department, G. M. Malik, was not only an able officer but also himself interested in the survival of Kashmir's wild life.

But it is obvious that as the Game Warden, whose duty it is to preserve the wild life of the State, is under the Chief Conservator of Forests, and as there are considerable patches of forest in the area, the place ought to be under the Forest Department—which should have sole and full control and therefore full responsibility for the preservation of the flora and fauna of the area.

The status of the 52 square mile Lower and Upper Dachigam was originally a *rakh* or game preserve of the Maharaja. I understand that it was notified as a sanctuary in Order No. 276/c of 1951 dated 14-3-1951 while under the jurisdiction of the Fisheries Department, but the other Departments (i.e. Tawaza and Forest) do not appear to be aware of this, and its status continues to be uncertain. (The Forest Department is now maintaining a staff of 2 Rangers, 2 Deputy Foresters or Head Watchers and 18 Game Watchers in the whole of Dachigam.)

The position of Dachigam is further complicated by the fact that other Departments also have a claim on the area. For it is the catchment area of the Srinagar water supply, with the Harwan reservoir just outside the southern boundary, and the Irrigation and Water Works Departments have a big say whenever discussions are held. In addition, the Public Works Department is in charge of the road through Lower Dachigam ; and the Electricity people go there to maintain the small generator and overhead wires, with the Telephone people going there to repair their wires. Also I hear that the Mulberry people are trying to go there, and also graziers of domestic cattle !

Of course most of the above separate Departments have their role to play and their own specialized work to do, but unfortunately there does not appear to be much, if any, co-ordination between them, and they all seem to act independently of each other.

Clearly it would be advantageous from every point of view if only one Department, preferably the Forest Department, were to be in overall charge of the whole place, and if all the other Departments were to be subordinated.

Finally the character of the whole place has been changed by yet another Department entering on to the scene. The Department of Agriculture has recently entered the fray in a big way with a Government Sheep Breeding and Research Farm. For this purpose about four square miles of Lower Dachigam have been occupied, and Rs. 10,00,000 worth of buildings constructed. In addition to more than 1000 sheep, there are a number of dogs (officially 4 but really about 40, so I was told), goats (officially 15 but really about 40-50) and a staff of about 25 men with extra men engaged in grass/hay collecting.

These sheep, together with the goats which are kept as 'leaders' of the sheep, are stall-fed during the winter and therefore do not compete very much with the deer for food in Lower Dachigam. But in the spring when the snow melts the sheep come out and enter into direct competition with the deer for the grazing in Upper Dachigam until the late autumn. The effects of combining sheep and deer in the same range are not beneficial to either, and these will be discussed later.

In the meantime it is sufficient to say that it appears to be a most unfortunate planning mistake that the Sheep Farm, which could have been sited in other parts of Kashmir where there is good and even better grazing, should have been allowed to be set up in the catchment area of the Srinagar water supply which is also the home of the rare Kashmir Stag and the main potential national park of Kashmir.

VI. General Account of my Visits

My first visit to Lower Dachigam took place early in April 1957, when patches of snow were still on the ground and the spring flowers were starting to appear. Nearly all the stags had already migrated to higher elevations, but I saw quite a fair number of hinds and fawns. They were not very shy, and I was able to photograph and film them without much difficulty during a number of days.

I visited Upper Dachigam in September of the same year, camping at Sangergulu at about 11,000 ft. I saw several *hangul* but they were scattered in small groups and too far away to be photographed. Although the summer flowers in the alpine meadows were nearly over, the mountain scenery was simply magnificent, defying any attempt at description.

I went to Lower Dachigam again in all its autumnal glory in early November 1960, and in the thickets glimpsed a fine 10-pointer stag with a group of hinds and fawns. But the majority of the deer had not yet come down.

In August 1964 I paid a visit to Lower Dachigam, and was surprised to learn that about ten hinds (but no stags) had remained behind in their winter range and had not migrated to higher elevations. I also learnt, after much questioning (with the Game Warden acting as interpreter), that this phenomenon occurs every year. Some investigation, I think, needs to be done to ascertain whether these hinds are barren ones, or some of those which in alternate years do not breed, or very young or very old non-breeding animals, or animals enfeebled to some extent by injury or ill-health.

Finally, I spent nine days in Lower Dachigam in February 1965 when it was still winter, in order to observe the *hangul* more closely and obtain photographs of them in the snow. I found them much fewer than in 1957, and much more frightened of human beings.

Accompanied by Qasem Wani, the second Game Watcher, I set up my cloth hide on 24-2-1965 and disguised it with branches and leaves, near a salt-lick, and waited each afternoon. On the previous day we had seen a 12-pointer stag, a 10-pointer, a 2-pointer and nine hinds at this place when I arrived on the road ; and later that afternoon when I was searching for the best place for erecting the hide three hinds came very close, the leader uttering her staccato barks of apprehension. On 24-2-1965 when I sat up in the hide an 8-pointer, two 2-pointers and about 30 hinds and fawns came to the lick and were photographed in the fading light ; but they had become noticeably more wary than on the first day. For the next two days none came. On 27-2-1965 about 30 hinds and fawns came out. Then for the next three days only wild pig came, no *hangul* : apparently they had become even more wary.

The reasons for this increased wariness were probably as follows : Firstly, there was continual disturbance from some men of the P.W.D. working on the road near by, the men employed by the Sheep Breeding Farm, the men of the trout hatchery, the men of the rest house and others.

And secondly, a thaw had set in, and it appears that *hangul*, like the Red Deer of Europe, may become more irritable and wary during a thaw because of changes in humidity. Darling (1937) has observed that Red Deer in Scotland are calmer and more approachable in dry atmosphere with low humidity, or at saturation point : ' if humidity remains steady there is olfactory accommodation and irritability is lessened '. With steady frost and steady humidity and still air there is less scent and the deer are more approachable. But with variable humidity the deer become more irritable, and snow in its onset and disappearance causes the most spectacular movements of deer.

While I was waiting in my hide for chances of photographing *hangul*, a friend of mine accompanied Ghulam Hyder, the Head Game Watcher, to observe the numbers and other details of deer seen on the mountain slopes. A group of stags comprising a 12-pointer, a 10-pointer, an 8-

pointer and a 2-pointer was seen on several occasions. Small groups of hinds and fawns up to 18 in number were moving here and there. But there seemed to be no definite pattern in the groups, for sometimes a stag or two accompanied the hinds and fawns.

The total number estimated to be in Lower Dachigam was said by Ujaggar Singh (the Range Officer), Ghulam Hyder and Qasem Wani to be in the region of 160.

The details given to me by S. Atta Mohmad Khan, the Game Warden of Kashmir, of the annual ' census ' (really an estimate, I think, and to be read with some degree of conservatism and caution !) conducted early in 1965 are as follows :

Locality	Stags	Hinds	Fawns	Total
Lower Dachigam ..	10	110	40	160
Tral Range ..	28	69	*	97
Srinagar Range ..	5	8	*	13
Dessu Rakh ..	2	8	*	10
			Grand Total	280

* In these cases the number of fawns is not given, and must be considered as merged with adults.

In the above figures the alarming factor is the imbalance of the sex ratio, especially in Lower Dachigam, where it is 10 stags to 110 hinds, or 1 stag to 11 hinds. Stockley (1936) mentions that in his time the ratio was 3 stags to 10 hinds. G. K. Whitehead has informed me that he considers the ideal ratio for Red Deer to be 1 stag to 1½ hinds. Darling (1937) states that 1 stag to 2 hinds is the optimum ratio, and says that the mature stags come first into rut, and that their fawns being born earlier are the most likely to survive the following winter.

With so few stags in Dachigam, it means that they might suffer from exhaustion during the rut, having to cope with a larger number of hinds—especially if a spell of cold weather follows the rut. And with so few mature stags available, and with disturbance from shepherds and others up in the mountains, there will be less chance of the adult stags mating with the hinds. Also younger stags will have more opportunity, and as Darling (1937) points out the younger and immature stags come into rut later, and their progeny being born later are less likely to survive the winter. He says : ' late calves would be better unborn, for the winter takes extra toll of them . . . . a population diminishing by such means is in serious danger of extinction '.

Incidentally, *hangul* stags shed their antlers from the middle of March to the end of April. The new antlers are hard and clean by the middle of September when the rutting season commences. The height of the rut is said to be about October 20th. The fawns are born in April and May, and hinds usually produce in alternate years.

Above : A *tuj* and a hind in February. *Below :* Hinds, fawns, and an 8-pointer stag near the salt-lick

(*Photos : E. P. Gee*)

Above : A couple of hinds have a difference of opinion. *Below :* The 'hide' from which the three foregoing photographs were taken, after the thaw

(*Photos : E. P. Gee*)

On my last day in Dachigam I visited the Sheep Farm in company with Rashid Wani, Soil Conservation Officer ; and I am grateful to the Manager of the farm for showing us round. Some details of the farm have been given earlier in this report, and the probable effects of sheep in a deer range are stated in the next section.

VII. Present Status and Future of the Kashmir Stag

The present status of the *hangul* is precarious. Although there have been no real censuses conducted by competent persons on a scientific basis, the rough estimates given in section III are a pointer to the direction in which the *hangul* is heading :

Year	No. of *hangul* in Kashmir
1900	3000-5000 ?
1947	1000-2000 ?
1954	300 ?
1957	400 ?
1958	550*
1960	250*
1962	360*
	200 ?
1965	280*
	180 ?

Key. ? indicates my own estimate ;
* indicates official 'census' figure

In addition to the above figures, which are for Kashmir, there are reported to be a few, perhaps only half a dozen, *hangul* in the Chamba District of Himachal Pradesh. These are said to be under strict protection.

Although the main habitat of the deer, Lower and Upper Dachigam, was supposed to have been made into a sanctuary in 1951, nothing appears to have been done to implement the Order. And although the Kashmir Stag was placed by the Indian Board for Wild Life on the list of species for full protection as long ago as 1952, nothing appears to have been done to give legal protection to the animal.

Even if wild life preservation cannot receive a high priority from the Kashmir Government, yet still the fact that Dachigam is the catchment area for the Srinagar water supply is sufficient reason for the full protection of the whole valley. So far from giving full protection to this catchment area (which also happens to be the home of the rare *hangul* and a potential national park), some grazing by domestic cattle and some firewood collecting have been allowed there, and vast flocks of sheep have been housed there.

Regarding cattle, Stockley (1936) has remarked : ' Foot and mouth disease has also taken terrible toll of the deer in the last ten years, and the cause of this must be put down to errors of preservation. Every winter large numbers of deer crowd into the safety of the State *rakhs*, of which

the principal, and far the largest, is Dachigam . . . . which is much fouled by village cattle . . . . These deer contract the fatal disease and carry it up with them to the high grounds when the snows melt, infecting others and spreading the disease over a wide area.'

Very recently some new information has come in concerning the danger of allowing domestic cattle to graze in wild life sanctuaries in India. During 1964 Schaller (Shah et al. 1965) took sera of deer in Kanha National Park, where a great number of cattle are somehow allowed to graze inside the park. Examination of these sera with those taken from deer in the United States of America shows that ' . . . the antibody prevalence in Indian deer (6 of 10) was higher than in the U.S. deer (1 of 39). A reason for this finding may be that in Kanha Park, the deer are more likely to be in contact with cattle which graze in the same forests and compete for forage.' In a covering letter to me Dr G. B. Schaller has pointed out that this virus (*Myxovirus parainfluenza 3*) ' is the main agent causing shipping fever in cattle. It does not affect the deer until they are put into a stressful situation—like food shortage. Then it may kill them. The virus is undoubtedly gotten from the cattle. Another reason for keeping cattle out of a sanctuary ! '

Regarding the sheep, it is a fact that these are stall-fed in the winter, and therefore there is perhaps no severe strain on the grazing/browsing potential of Lower Dachigam in the actual winter. And at the rate of one deer to 65 acres (ten per square mile) and one sheep to 25 acres, there should be sufficient summer pasture in the mountains for both the deer and the sheep (if the latter are restricted to 1000). But there are other factors to be taken into account :

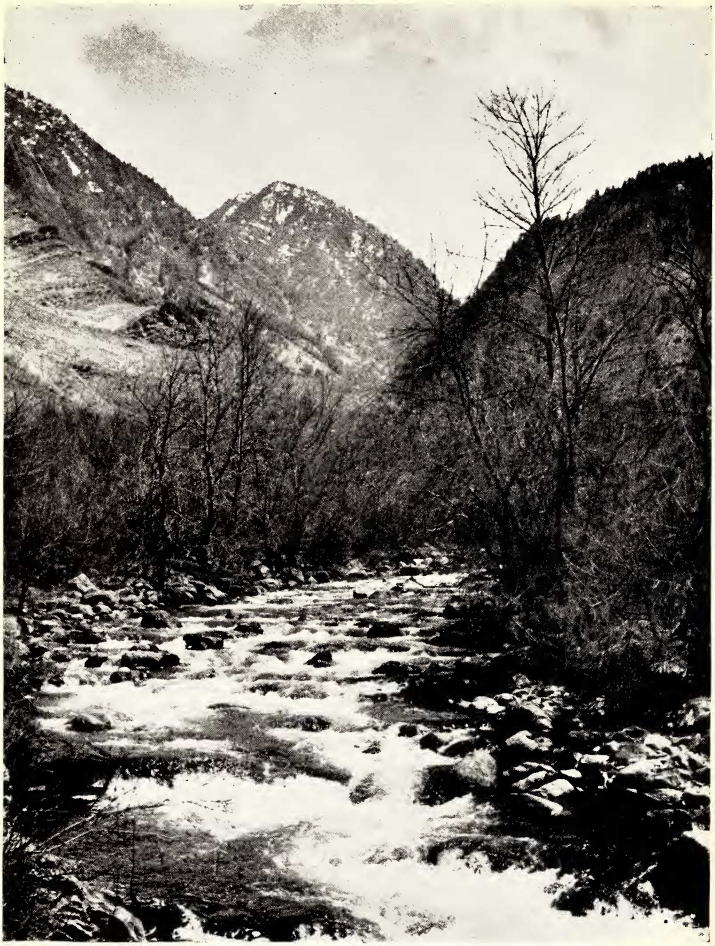
1. DISTURBANCE from men, guns, dogs, goats and so on. In addition to the sheep actually grazing, some 25 men are in charge of the sheep, and with firewood collecting, hay and grass collecting and so on, the amount of disturbance must be very great all the year round. The men possess some guns—ostensibly for self-defence and sheep-defence against leopards and bears—and who is to know whether these guns will not be used for shooting deer ' for the pot ' or for sale ?

Darling (1937) says of a certain part of the Scottish highlands : ' The presence of sheep is the reason for the few deer on these last-named areas. Deer and sheep have similar tastes in grazing, and while the carrying-capacity of a forest is lowered by even a light sheep stock, say one to ten acres, there is disturbance by men and dogs which is, I think, of greater importance '.

The existence of similar tastes in grazing is confirmed by Murie (1951) who says : ' Sheep are as " omnivorous " in their selection of plant foods as elk and they get over all kinds of terrain. Here we must recognize direct competition, from every standpoint.' And Smith (1953) says :

'Rubbing trees' in Lower Dachigam, where the stags thrash their antlers
(*Photos : J. N. Newton*)

Hinds in the undergrowth of Lower Dachigam in April, after a thaw
(*Photo : E. P. Gee*)



The Dagwan River, above the Draphama rest house, in Lower Dachigam, in April

(*Photo : E. P. Gee*)

' The similarity of deer and sheep diets is sure to cause conflict wherever the supply of preferred species is inadequate to satisfy the requirements of both animals '.

2. Parasites and Diseases. There is always great danger that the parasites and diseases of the sheep may spread to the deer. Longhurst (1954) says of blacktailed deer in California that they shared with sheep 21 species of parasites. And that this affected the deer adversely because both competed for the same forage and in the winter the sheep received supplementary food from man, which the deer did not. As the result of lack of food and parasitism many deer died during the winter while the sheep survived.

And Whitehead (1950) says of sheep that they ' have so many of the same parasites and diseases that attack deer, and they may even introduce other ailments to which deer are not normally exposed '.

My own considered opinion is that unless Lower and Upper Dachigam can be constituted into a sanctuary or national park to be entirely under the jurisdiction of one Department (the Forest Department) to the exclusion of all other interests except water supply and trout hatchery, and unless all grazing by domestic cattle and firewood collecting can be eliminated, and unless the sheep can be removed, and unless the *hangul* can be given full protection—unless all these measures can be effectively taken, not only will the *hangul* become extinct but also the catchment area of the Srinagar water supply will ultimately become denuded, eroded and ruined.

It has been officially stated by the Kashmir Government that they are shy of making Dachigam into a sanctuary or national park because the entry of visitors would contaminate the water supply. I myself cannot understand this argument. For a few visitors entering by car, on payment of a fee, and stopping at the Draphama Rest House, would not contaminate the area, as must do the labourers working on the road, the men of the sheep farm and so many others ! And when massive firewood cutting was once done by 200 labourers, was there then no outcry against contamination ?

The steps listed above need to be taken in order to save the area and the wild life from destruction. In addition, I recommend, and have been for the last eight years recommending, that a small number of *hangul* be kept in an enclosure somewhere between Dachigam and Srinagar for the purpose of ensuring the survival of the deer and also for providing a tourist attraction. This would not be a difficult or expensive step, and it has been done before in the time of the Maharaja.

Of capturing these deer and keeping them in captivity, Ward (1921) says :

' In order to capture full grown stags and hinds it is essentially